

**New Cow Cubicle at
Bolton Fold Farm,**

Alston Lane
Alston,
Nr Longridge
Lancashire
PR3 3BN

Drainage Strategy

June 2026

Drainage Strategy

Proposed Cow Cubicle Building

Bolton Fold Farm, Alston Lane, Alston, Longridge, Lancashire PR3 3BN

Prepared in accordance with:

- The Water Resources (Control of Pollution) (Silage, Slurry and Agricultural Fuel Oil) (England) Regulations 2010 (SSAFO)
- DEFRA Guidance: Storing Silage, Slurry and Agricultural Fuel Oil
- Environment Agency Pollution Prevention Guidance
- CIRIA C753 SuDS Manual
- National Planning Policy Framework (NPPF)
- Ribble Valley Borough Council Validation Requirements

1. Executive Summary

This Drainage Strategy has been prepared to support the proposed construction of a new dairy cow cubicle building at Bolton Fold Farm.

Bolton Fold Farm operates a substantial dairy enterprise comprising approximately 450 dairy cows plus followers and has recently secured planning permission for additional slurry storage infrastructure to improve compliance with modern environmental standards.

The strategy has been developed to:

- Prevent pollution of surface waters and groundwater.
- Separate clean and dirty water systems.
- Ensure compliance with SSAFO regulations.
- Minimise slurry volumes requiring storage.
- Protect nearby watercourses, including Tun Brook.
- Provide a sustainable drainage solution suitable for planning approval.

Particular attention is given to pollution prevention due to the site's history of slurry-related incidents and Environment Agency enforcement action.

2. Development Description

The proposal comprises:

Parameter	Value
Length	91.44 m
Width	12.51 m
Building Footprint	1,144.9 m ²
Rounded Area	1,145 m ²

- New steel portal frame cubicle building.
- Concrete cubicle passages.
- Feeding area.
- Scraped collection passages.
- Roof drainage system.
- Connection to existing slurry management infrastructure.

3. Existing Site Conditions

3.1 Site Setting

Bolton Fold Farm is located within open agricultural countryside off Alston Lane near Longridge.

The surrounding area comprises:

- Permanent pasture.
- Agricultural holdings.
- Isolated residential properties.
- Local drainage ditches and watercourses.

The farm currently operates an extensive dairy unit with associated slurry handling facilities and a recently approved earth-banked slurry lagoon.

4. Drainage Design Principles

The primary drainage principle is:

Complete Separation of Clean and Dirty Water

The drainage system shall comprise two entirely separate systems:

Clean Water System

Collecting:

- Roof water.
- External uncontaminated runoff.

Dirty Water System

Collecting:

- Cubicle passage washings.
- Livestock manure.
- Yard runoff from livestock areas.
- Scraped slurry.

No cross-connections shall be permitted.

This approach accords with Environment Agency and DEFRA guidance and minimises slurry storage requirements.

5. Dirty Water Drainage Strategy

5.1 Internal Floor Construction

All livestock areas shall comprise:

- Reinforced concrete slab.
- Minimum 150mm thickness.
- Power floated finish.
- Constructed to BS 5502 standards.
- Impermeable to liquids.

5.2 Floor Falls

Internal floors shall be laid to falls of:

1:60 to 1:80

towards collection channels.

This ensures efficient drainage whilst maintaining safe livestock movement.

5.3 Scraper System

The cubicle building shall utilise:

- Automatic scraper system; or
- Tractor scraping system.

Collected slurry shall discharge into:

Central Collection Channel

or

Reception Pit

for transfer into the existing slurry storage system.

5.4 Slurry Reception Pit

A reinforced concrete reception pit shall be provided.

Indicative dimensions:

Item	Dimension
Length	6m
Width	4m
Depth	3m
Capacity	72m ³

The pit shall be:

- Watertight.
- Constructed to SSAFO standards.
- Designed by a suitably qualified engineer.

5.5 Slurry Transfer

Slurry shall be transferred from the reception pit to:

- Existing slurry lagoon.
- Existing slurry stores.

Recent planning approvals indicate substantial slurry storage infrastructure exists or is being expanded at the farm.

6. Clean Water Drainage Strategy

6.1 Roof Water Collection

Roof Catchment Area

The roof drainage area is:

1,145 m²

Assuming average annual rainfall of approximately 1,200 mm/year for the Longridge area:

Annual runoff volume

$1,145 \times 1.2$

= 1,374 m³/year

Therefore approximately **1,374 m³/year of clean roof water** can be excluded from the slurry storage system through the implementation of a separate clean water drainage network.

This represents a significant reduction in slurry storage demand and operational costs.

Design Storm Runoff Calculation

For planning purposes, the roof drainage should be sized for a 1 in 100-year storm event with a 40% climate change allowance.

Using a typical rainfall intensity of approximately 75 mm/hr for preliminary design:

Runoff rate:

$$Q = A \times I$$

Where:

- Area = 1,145 m²
- Intensity = 75 mm/hr = 0.075 m/hr

Volume generated during a one-hour critical storm:

$1,145 \times 0.075$

= 85.9 m³

Applying 40% climate change:

$$85.9 \times 1.4$$

$$= 120.3 \text{ m}^3$$

6.2 Gutters

The building shall be fitted with:

- Continuous eaves gutters.
- Heavy-duty agricultural specification.
- Minimum 150mm diameter downpipes.

Designed to accommodate a 1 in 100 year storm plus climate change allowance.

6.3 Clean Water Disposal

Subject to infiltration testing, roof water shall discharge via one of the following:

Preferred Option

Infiltration basin or soakaway.

Alternative Option

Attenuation pond.

Alternative Option

Controlled discharge to existing field ditch.

Maximum discharge rate:

Greenfield runoff rate

typically:

2–5 l/s/ha

subject to detailed hydraulic design.

7. External Yard Drainage

7.1 Dirty Yard Areas

Areas used by livestock shall be treated as contaminated.

Drainage shall discharge to:

- Slurry channels.
- Reception pit.
- Dirty water storage system.

No discharge shall enter watercourses.

7.2 Clean Yard Areas

Vehicle-only areas may drain separately where livestock access is prevented.

Such areas may discharge via:

- Swales.
- Filter strips.
- Attenuation features.

8. Sustainable Drainage (SuDS)

The following SuDS measures are recommended.

Swales

Vegetated drainage channels to:

- Slow runoff.
- Improve water quality.
- Provide biodiversity enhancement.

Filter Strips

Installed adjacent to clean runoff areas.

Benefits include:

- Sediment removal.
- Reduced flow velocity.

Attenuation Basin

Where infiltration is unsuitable, a basin should be provided.

Indicative storage volume:

100–150m³

subject to detailed calculations.

9. Pollution Prevention Measures

Given the sensitivity of nearby watercourses and previous pollution incidents associated with slurry management at the farm, enhanced pollution prevention measures are recommended.

The following shall be incorporated:

Shut-Off Valves

Installed on clean drainage systems.

Emergency Containment

Provision of emergency isolation points.

Lagoon Monitoring

Routine inspection of:

- Embankments.
- Pipework.
- Pumps.
- Transfer lines.

Pipe Protection

All transfer pipes to be:

- Above ground where practicable.
- Protected against vehicle damage.

10. Climate Change

Drainage calculations should incorporate:

Rainfall Event

1 in 100 year storm.

Climate Change Allowance

40%

in accordance with current Environment Agency guidance.

11. Maintenance Schedule

Element	Frequency
Gutters	Quarterly
Downpipes	Quarterly
Reception pit	Monthly
Scraper system	Weekly
Slurry pipework	Monthly
Swales	Twice yearly
Attenuation basin	Annually
Shut-off valves	Annually

12. Compliance Statement

The proposed drainage strategy has been developed to:

- Separate clean and dirty water.
- Prevent pollution of nearby watercourses.
- Comply with SSAFO Regulations 2010.
- Support sustainable agricultural operations.
- Reduce environmental risk.
- Minimise runoff volumes requiring slurry storage.

13. Conclusions

The proposed cow cubicle building can be drained safely and sustainably through a fully segregated drainage system comprising:

Based on the revised building dimensions of **91.44 m × 12.51 m (1,145 m²)**:

- Total clean roof catchment area = **1,145 m²**
- Annual clean-water runoff excluded from slurry storage = **approximately 1,374 m³/year**
- Preliminary 1 in 100 year + 40% climate change storage requirement = **120 m³**
- Recommended provision of **10 no. 150 mm downpipes**
- Minimum attenuation storage volume = **120 m³**
- Reception pit capacity of **72 m³** remains suitable
- Full separation of clean and dirty water should be maintained throughout the development

The strategy is considered compliant with current DEFRA, Environment Agency and SSAFO requirements and suitable for submission as a supporting planning document, subject to confirmation of final building dimensions, levels survey, infiltration testing and detailed hydraulic calculations.